

Systematic

branch of science deals with the study of classification, nomenclature and taxonomy of organisms on the basis of evolutionary and morphological traits.

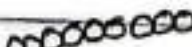
Types of cells : ① Eukaryotic ② Prokaryotic

① Monera	② Protista	③ Fungi
Prokaryotic	Eukaryotic	Eukaryotic
unicellular	uni, multi	uni, multi
④ Plantae	⑤ Animalia	
Eukaryotic	Eukaryotic	
multicellular	multicellular	

① Bacteria :

Some shapes of bacteria

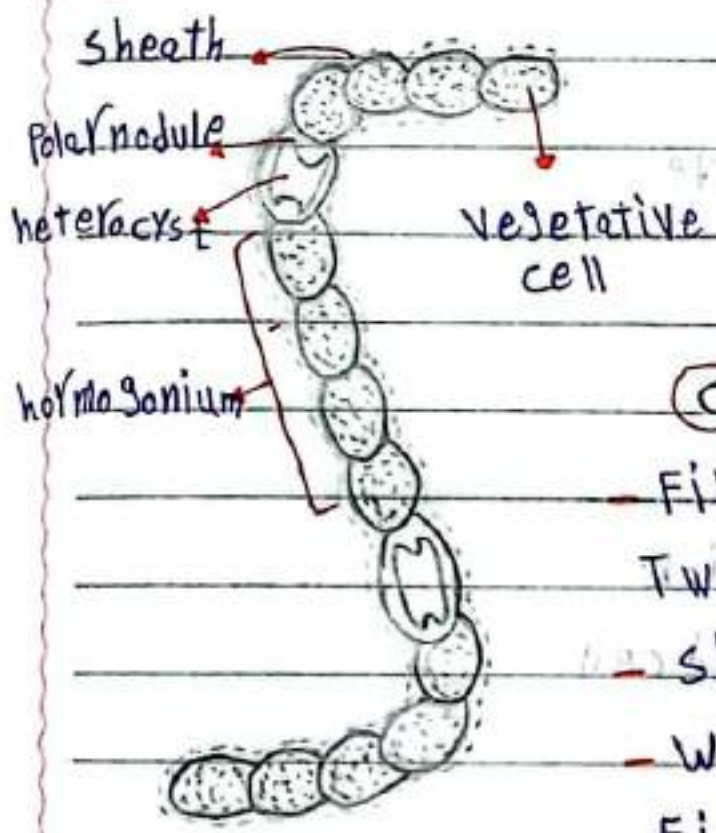
① Cocci (spherical shape)

			
single or no specific arrangement (random)	pairs diplococcus	chain streptococcus	tetrads



grape like
clusters (Staphylococcus)

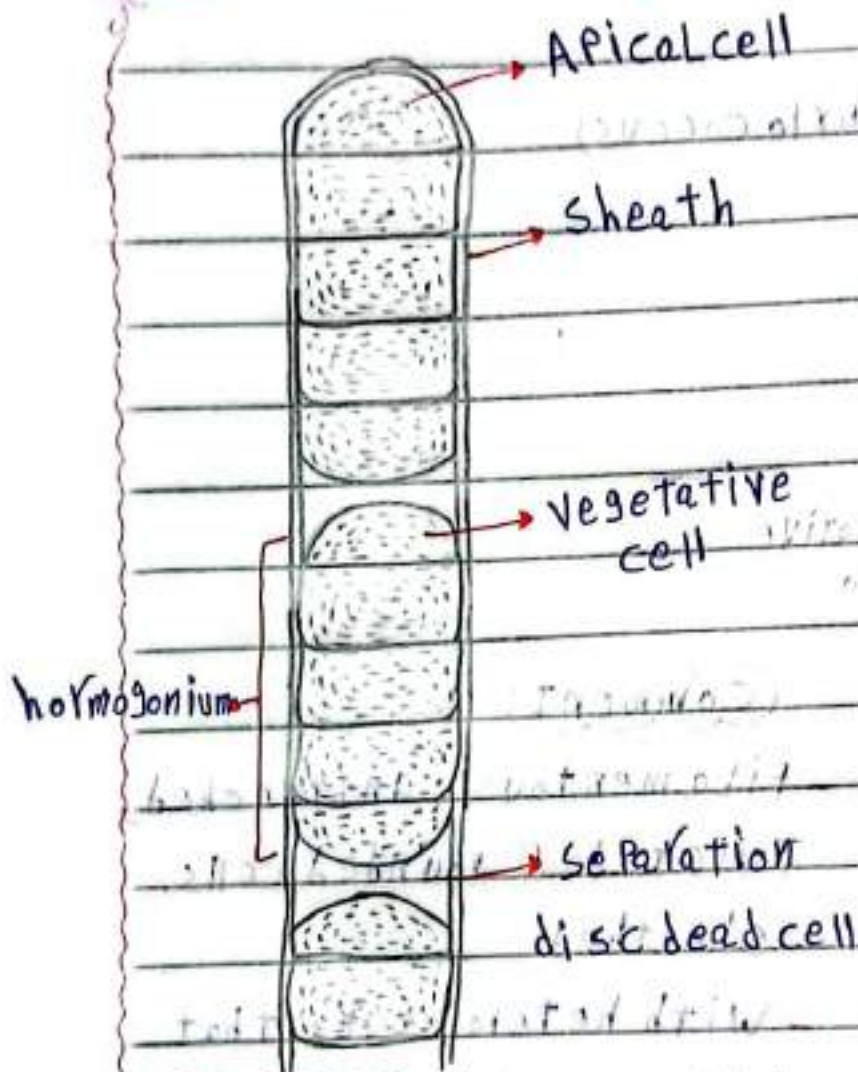
❑ Nostoc :



Comment

- Filamentous, unbranched, Twisted & rounded cells.
- Sheathed
- With heterocyst (that fix N_2) and hormogonia for vegetative reproduction.

② Oscillatoria :-



Comment

- Filamentous, unbranched, straight of rectangular cells.
- Sheathed or not.
- With hormogonia.
- With separation discs (Few dead cells).

② Bacilli (Rod-shape)



Single or no

Pairs

Specific Random arrangement

(diplobacillus)

chains

(streptobacillus)

③ Spirilla (Spiral-shape)



Vibrio



Spirillum



Spirochete

Kingdom : Bacteria

Phylum : Eubacteria

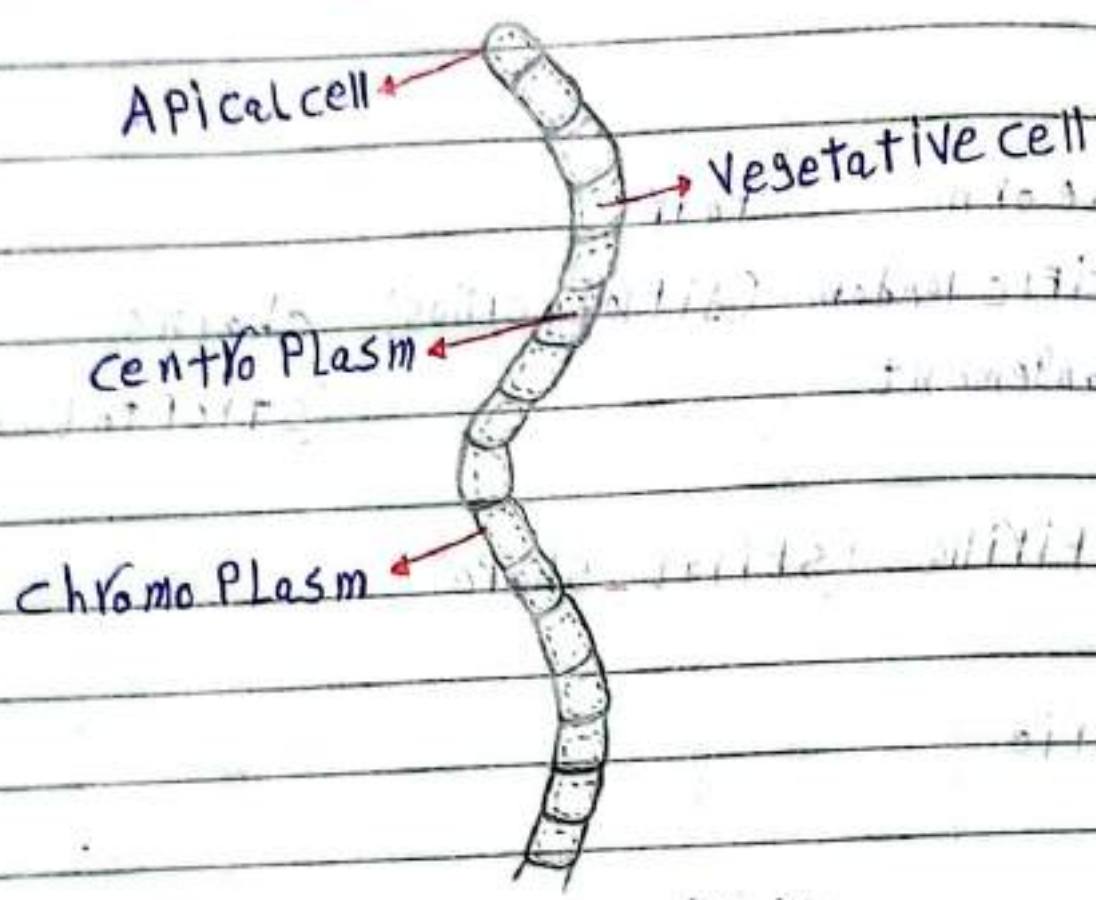
Class : Cyanobacteria (Blue green algae)

e.g : ① Nostoc

② Oscillatoria

③ Spirulina

[3] Spirulina :-



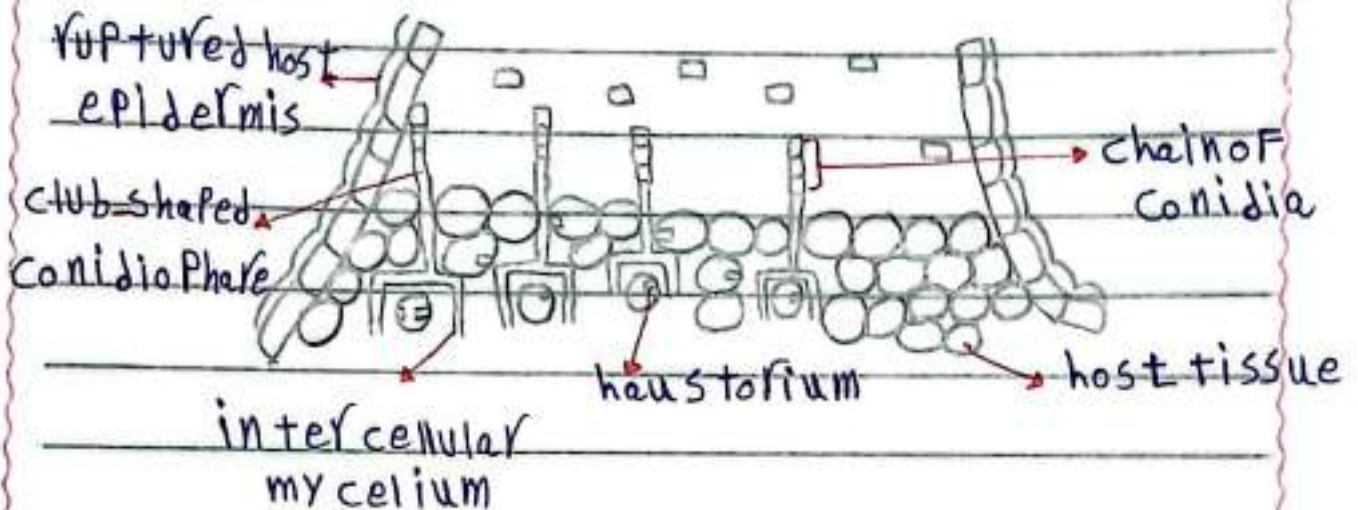
Comment

- Filamentous, unbranched, spiral of quadrate cells.
- Unsheathed.
- With an apical cell.
- With few separation disc (dead cells).

Kingdom : Protista

Phylum : oomycota (water molds) الفطريات المائية

e.g : Albugo عفن البياض



Comment

- Parasitic Fungus.
- mycelium → non septate, unicellular.
- ConidioPhore → short, club shaped, carries a chain of conidia.

K: Protista

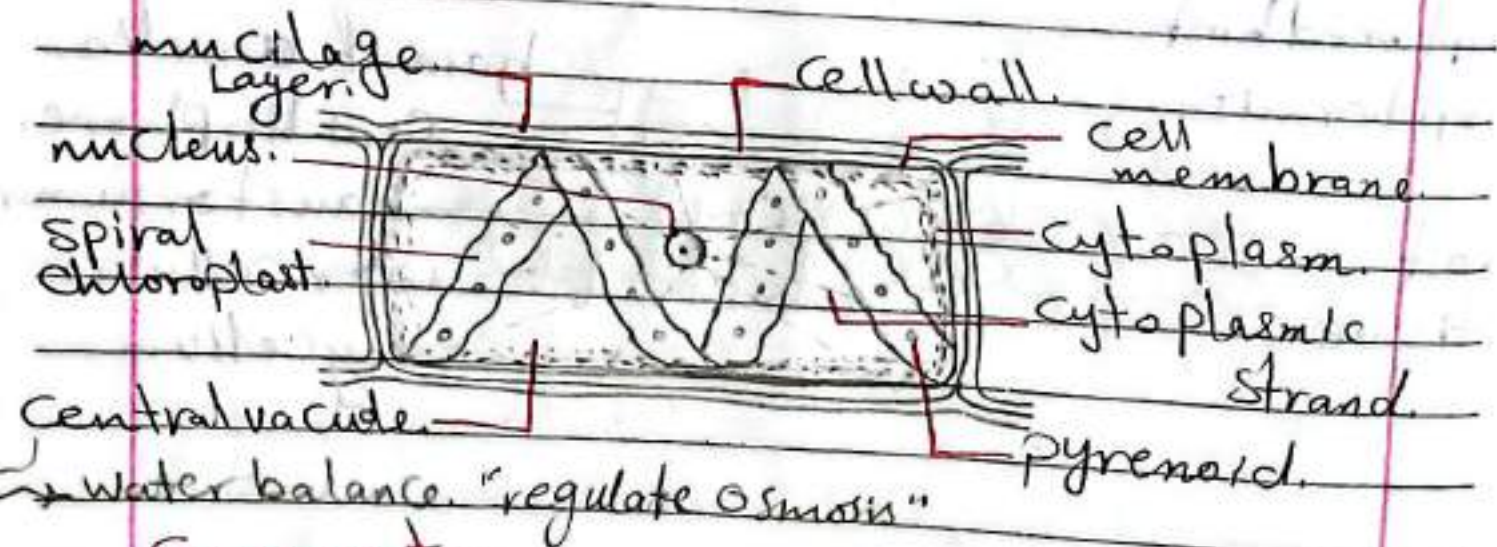
P: Chlorophyta "Green Algae"

O: Zygnematales

F: Zygnemataceae

eg: Spirogyra sp.

حريش



Comment:-

Thallus, unbranched filament.

Each cell has spiral shaped chloroplast with pyrenoid ~~the~~ "for starch storage" and peripheral cytoplasm and cytoplasmic strands.

Pigments

→ Photosynthetic "Ch a, Ch b"

→ Accessory "carotenoids, Xanthophylls"

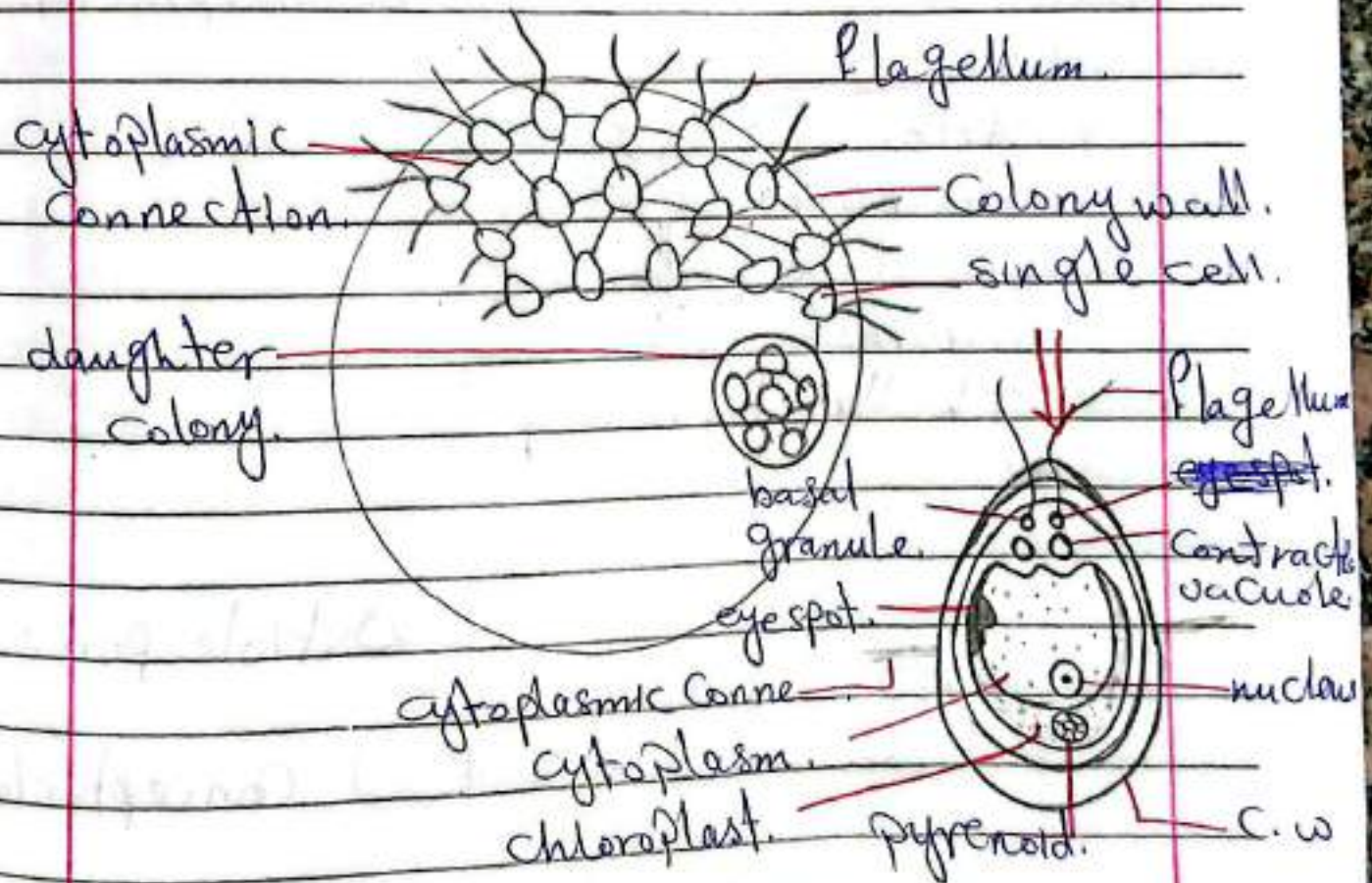
K: Protista.

P: Chlorophyta.

O: Volvocales.

F: Volvocaceae.

eg: Volvox sp.

Comment:

Thallus, hollow sphere colony. "Coenobium" with tens of thousands of cells.

Cells are of Chlamydomonas ^{oval} type, motile

Flagellated cells, connected by cytoplasmic strands

Pigments photosynthetic "Ch a, Ch b"

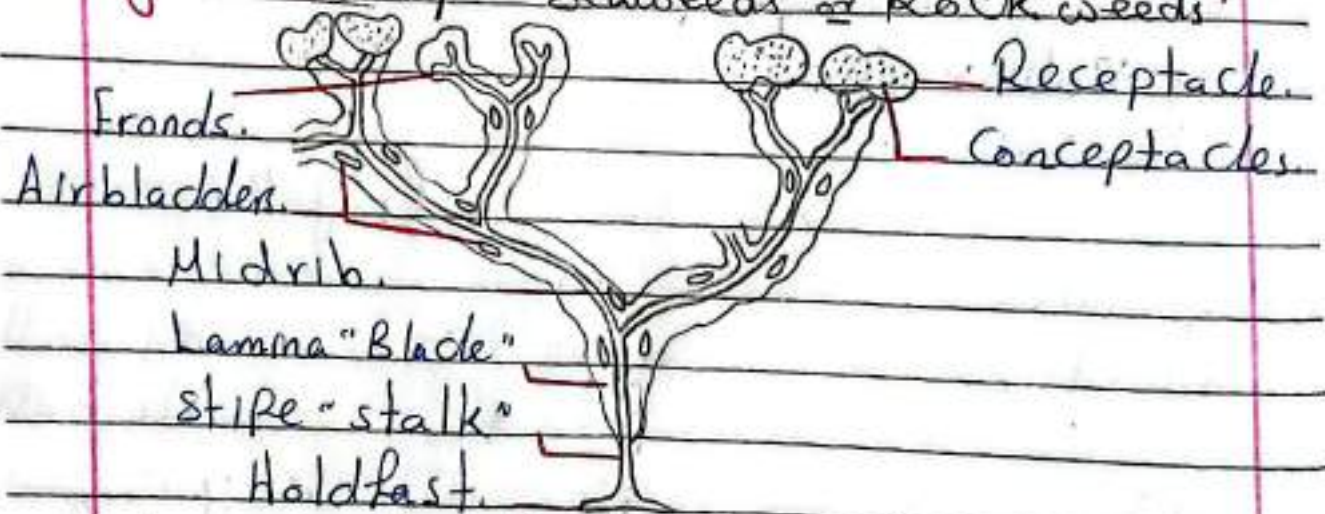
accessory "carotenoids, Xanthophylls" found in their green chloroplasts.

k: Protista.

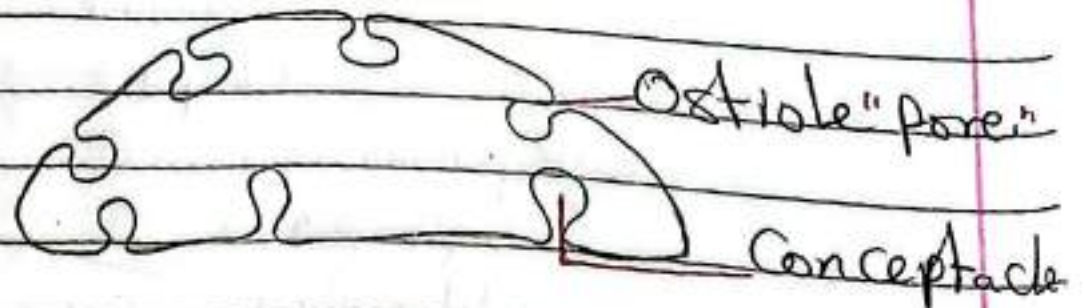
p: Chromophyta.

c: Phaeophyceae. "Brown Algae."

eg: Fucus sp. "Seaweeds or Rock weeds"



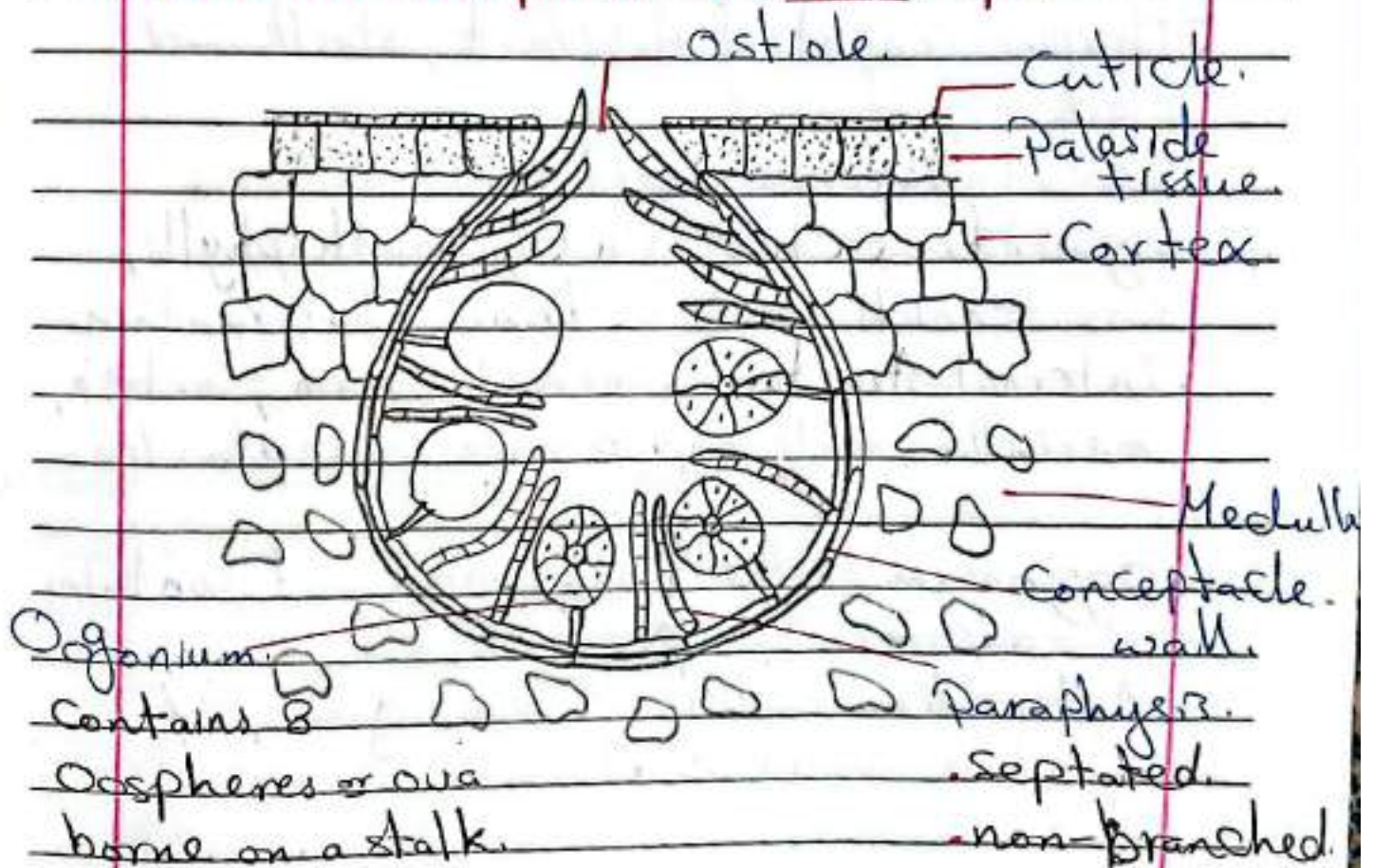
Thallus of Fucus sp.



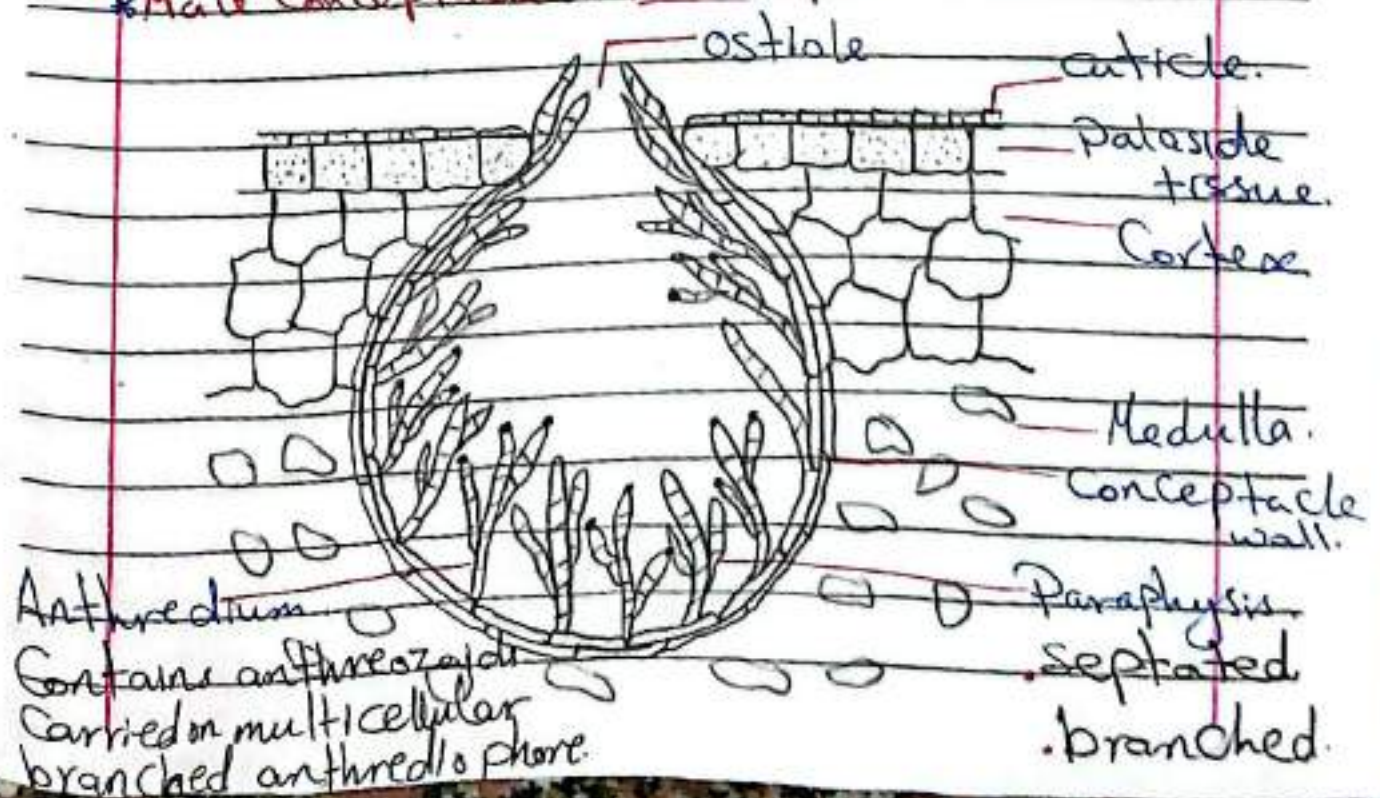
Cross-section through receptacle

↓
Fertile tip of
frond.

*Female Conceptacle of *Fucus* sp.*



*Male Conceptacle of *Fucus* sp.*



Comments:-

Thallus consists of Holdfast, stalk and Blade.

Sex organs in Conceptacles.

Pigments $\rightarrow$ Ch a, Ch c, xanthophylls, Carotenoids such as brownish Fucoxanthin.

Internal structure $\rightarrow$ meristoderm, cortex, medulla, male and female conceptacles.

Oogonium is the ♀ sex organ, it contains 8 ~~oospores~~ oospheres.

Anthredium is the ♂ sex organ, it contains anthrezoids.

K: protista.

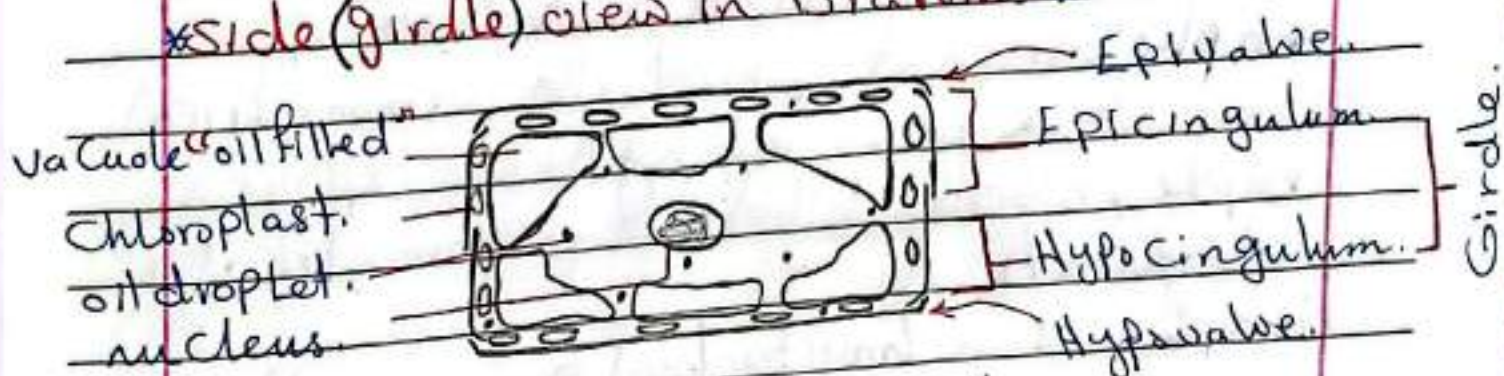
P: Chromophyta.

C: Bacillariophyta. "Diatoms"

01: Centrales. "Centric diatoms." مركزية

02: Pennates. "Pennate diatoms" ريشية

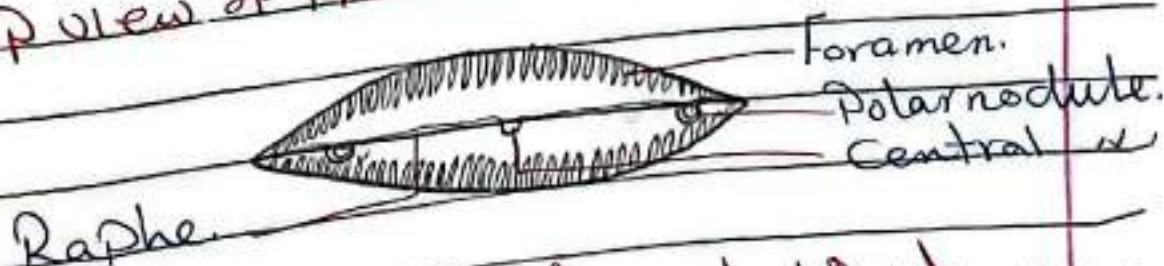
Side (girdle) view in Diatoms



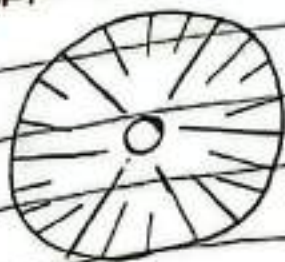
Epi valve + Epicingulum = Epitheca.

Hypo ~ + Hypo ~ = Hypotheca. F = Frustule.

Top view of Frustule of Pennate Diatoms



Top view of Frustule of Central Diatoms



Comment:

- Diatoms are unicellular algae.
- Each cell has a silicified wall Frustule composed of 2 overlapping walls "epitheca and hypotheca."

• Diatoms may be:

- ① **Centric** $\Rightarrow$ w is round in top view, raphe absent, radially symmetrical.
- ② **Pennate** $\Rightarrow$ w is elongate in top view, raphe present, bilaterally symmetrical. Asymmetrical.

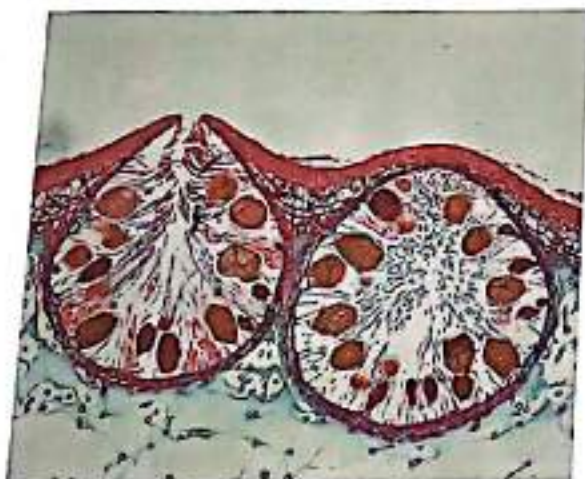
⊗ **Raphe** is a longitudinal groove in the valve.

Diatoms

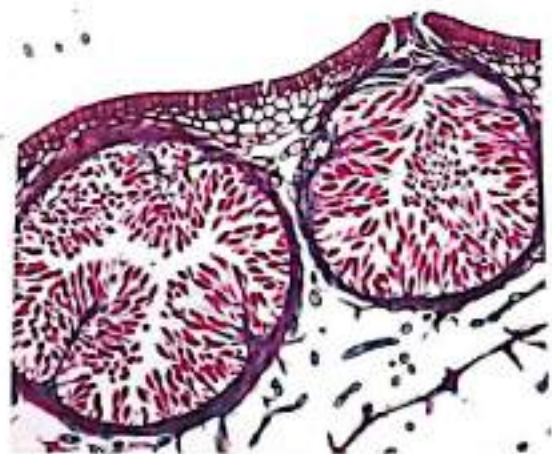




Thalls of *Fucus*

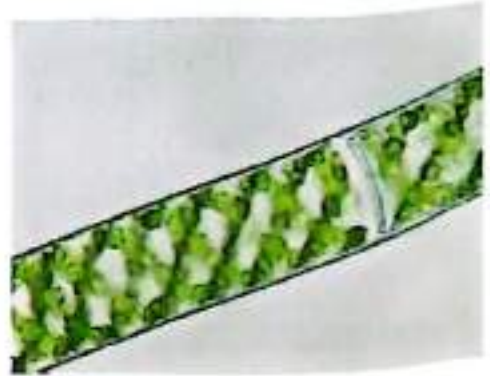


Female Conceptacle of *Fucus*

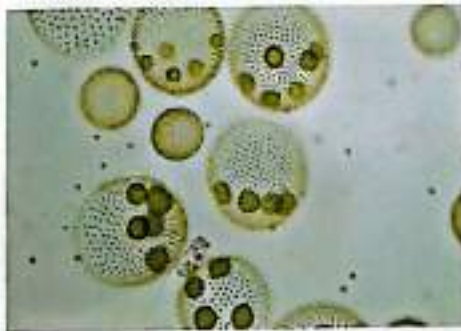
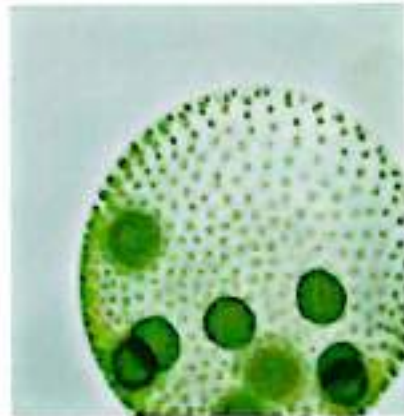


Male Conceptacle of *Fucus*

Spirogyra



Volvox



King dom : Fungi

Phylum : Deuteromycota

e.g : Alternaria

P₃ : Ascomycota

e.g : penicillium

- Aspergillus

P₂ : Zygomycota

e.g : Rhizopus

P₄ : Basidiomycota

e.g : Puccinia graminis

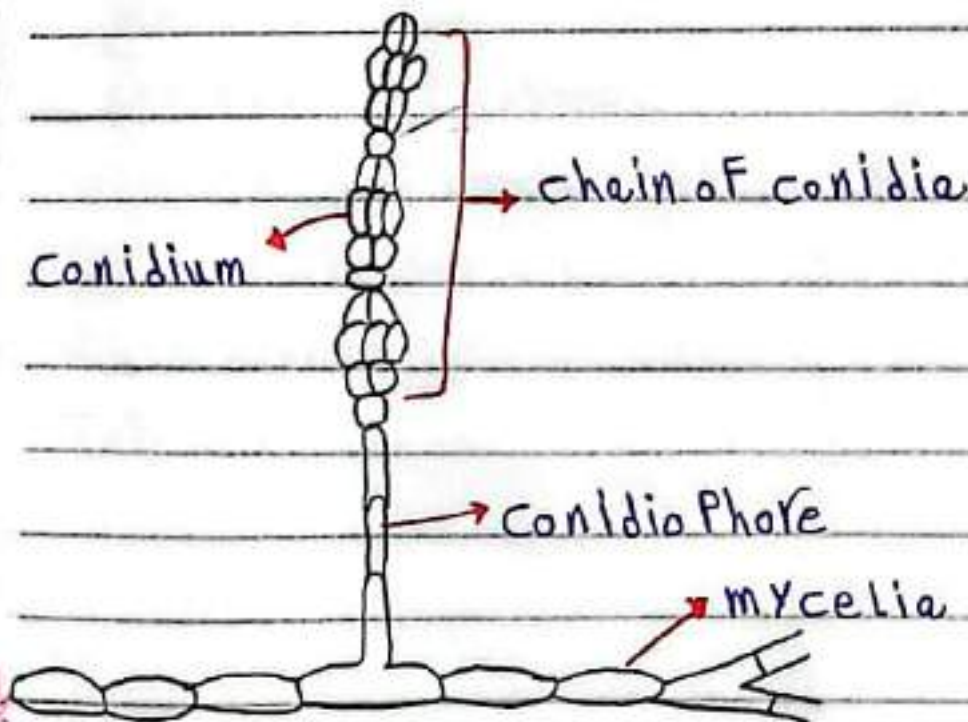
- Agaricus

King dom : Fungi

Phylum : Deuteromycota (Imperfect Fungi)

e.g : Alternaria

الفطريات الناقصة



Comment: (100%: not only)

Parasitic Fungus.

- With septate and branched mycelium.

- With septate conidiophore that carries a chain of conidia.

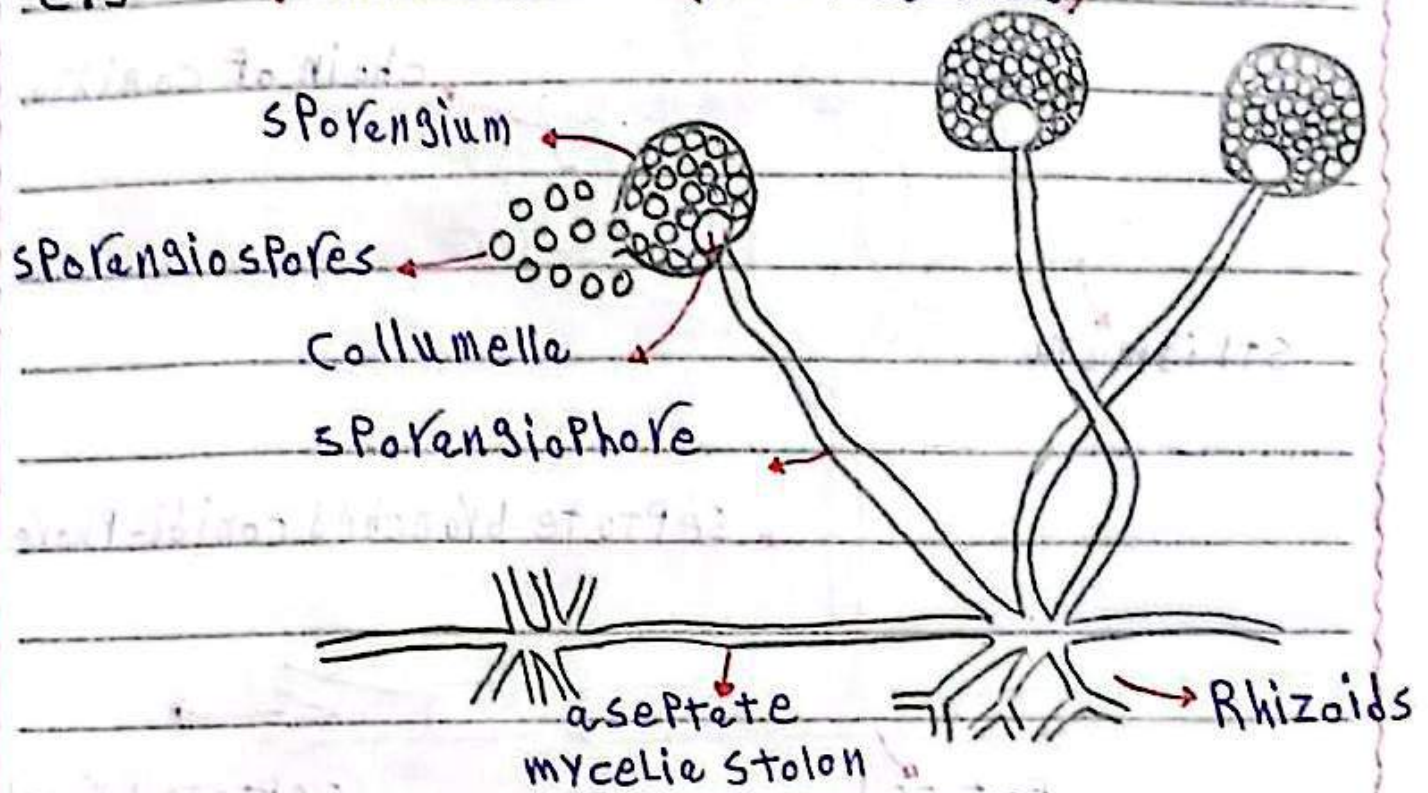
- conidium is: yellowish brown multicellular ovoid

- With both transverse and longitudinal septa.

Kingdom : Fungi

Phylum : Zygomycota Coenocytic Fungi

e.g : Rhizopus (the bread mold)



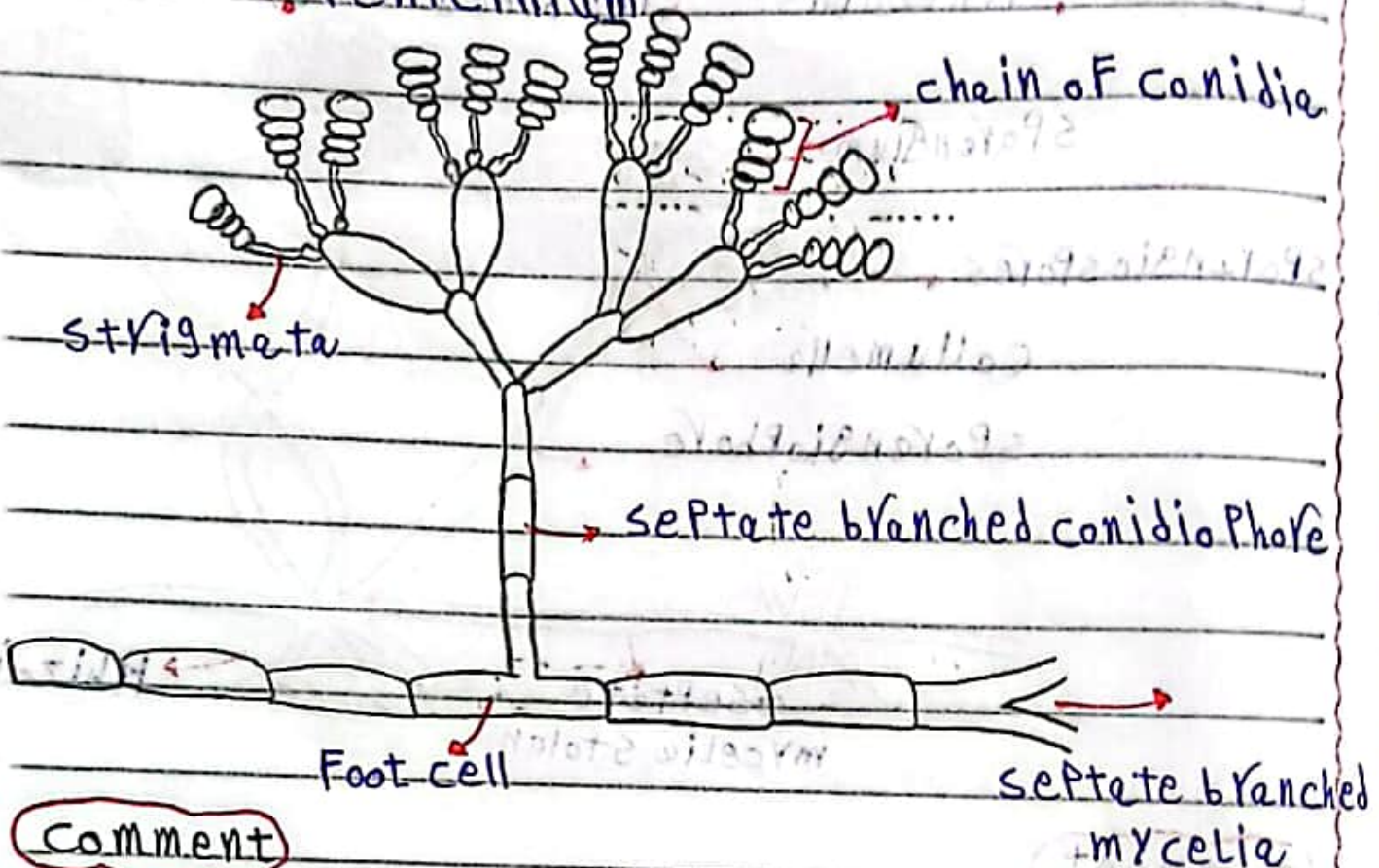
Comment

- Saprophytic Fungus.
- With non-septate mycelium (stolon).
- Sporangiphores arise opposite to the branched rhizoids.
- Each sporangiophore carries a large sporangium (spore sac).

King dom : Fungi

Phylum : Ascomycota (Sac Fungi)

e.g : Penicillium



Comment

Saprophytic Fungus.

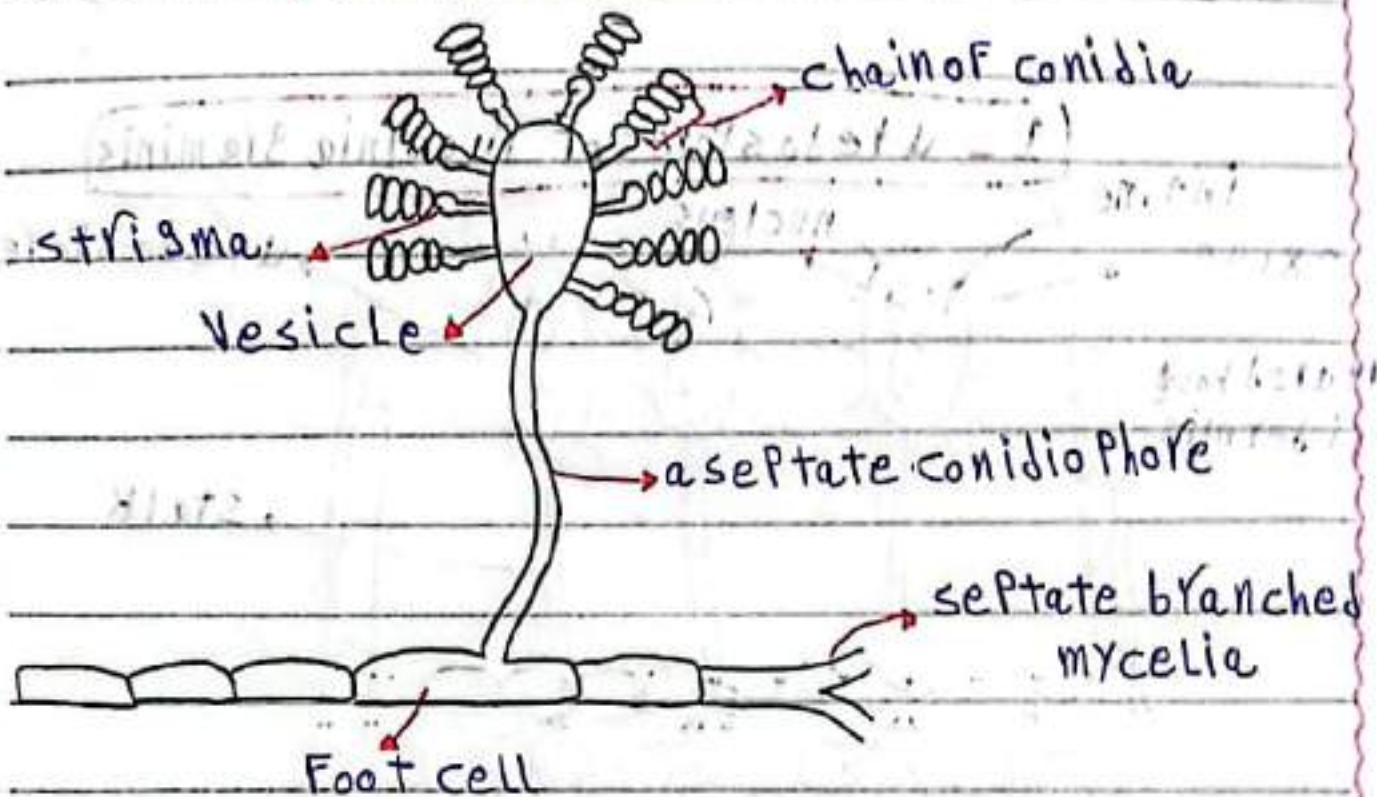
With septate and branched mycelium.

With septated branched conidiophores each carries chains of conidia on sterigmata.

Kingdom : Fungi

Phylum : Ascomycota (Sac Fungi)

e.g. : Aspergillus



Comment

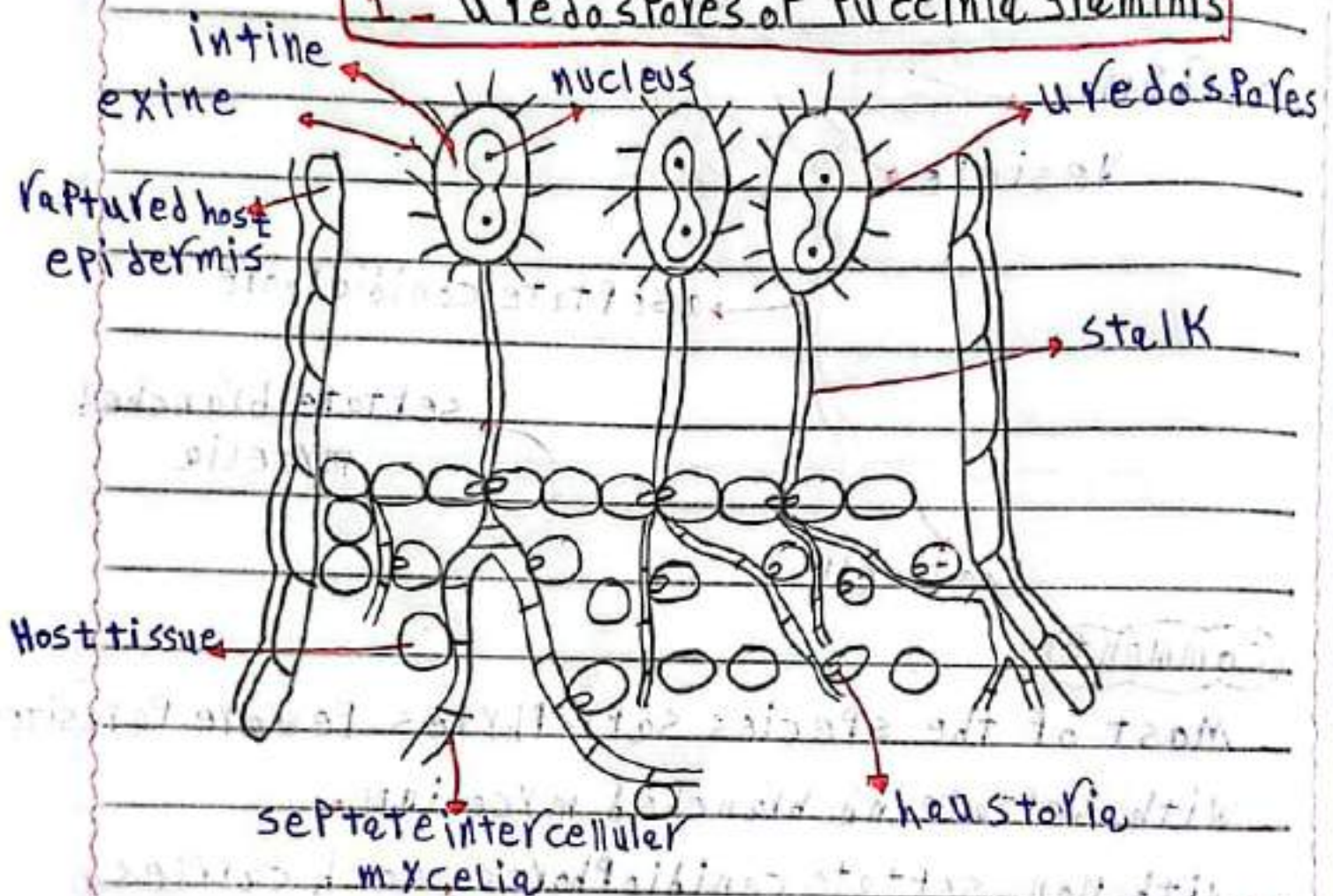
- Most of the species saprophytes few are parasites.
- With septate and branched mycelium.
- With non-septate conidiophores, each carries a vesicle with chains of conidia (on sterigmata).

Kingdom : Fungi

Phylum : Basidiomycota club Fungi

e.g : Puccinia graminis (The Wheat Rust)

1. Uredospores of Puccinia graminis



Comment:

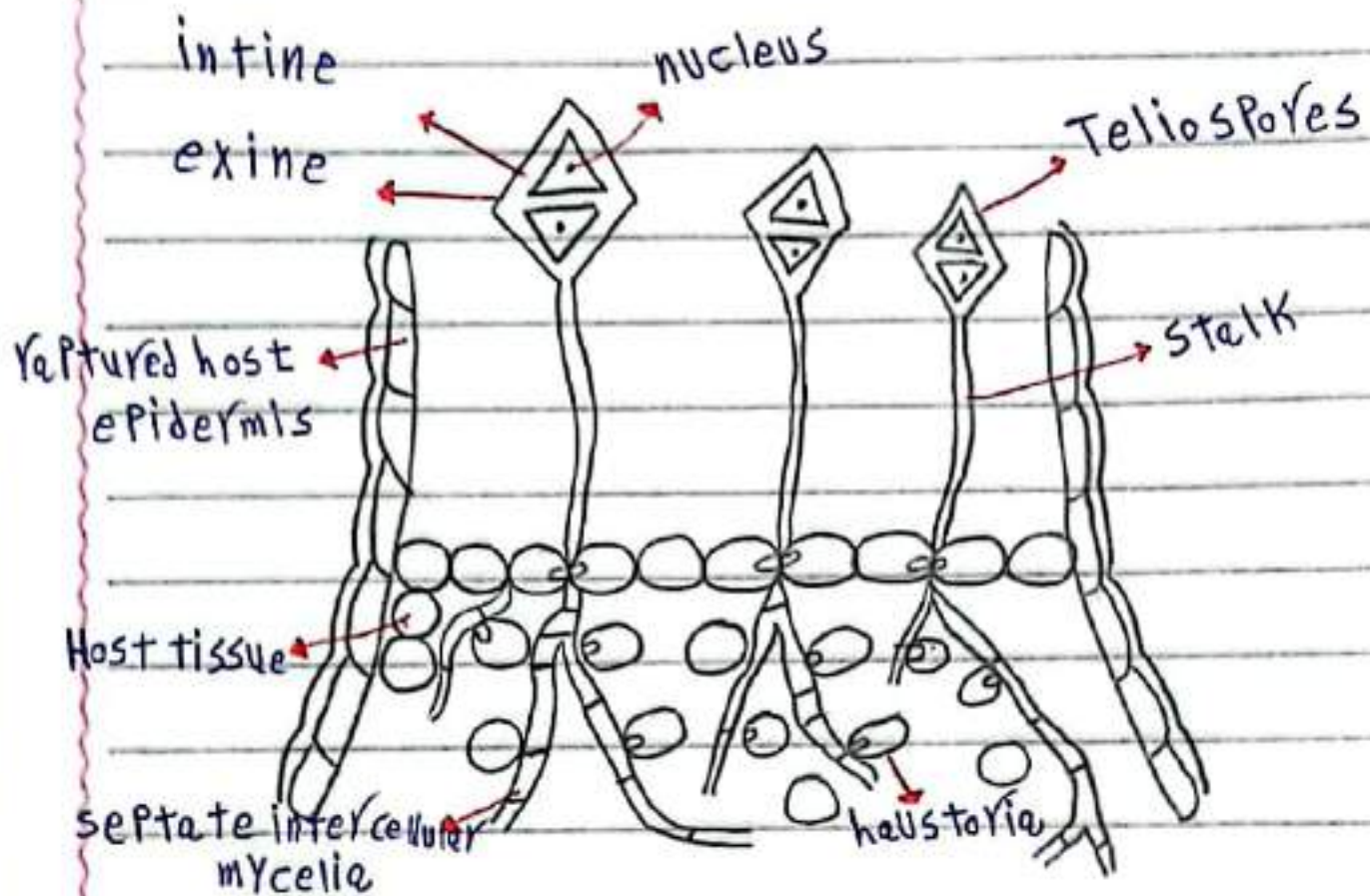
- a Parasitic Fungus infect Wheat (1st host) and Barberry (alternate host).

- Uredospores are formed on wheat, within uredosorus.

- Uredospores are stalked, unicellular, binucleate, orange spores.

- Mycelium is branched, septate and intercellular.

2. Teliospores of *Puccinia graminis*



Comment

- A Parasitic Fungus infect wheat 1st host and Barberry alternate host.
- Teliospores are formed on wheat within teliosorus.
- Teliospores are stalked, bicellular, uninucleate, smooth, brown spores.
- Mycelium is branched, septate and intercellular.